

CLAIMS

1. Genetically modified *Escherichia coli* JM109, capable of producing poly-beta-hydroxybutyrate in recoverable quantities of about 60% of the dry cell mass and bearing deposit number ATCC PTA 1579.
2. Genetically modified *Escherichia coli* as claimed in claim 1 transformed by a multicopy plasmid vector containing a DNA sequence coding for poly-beta-hydroxybutyrate biosynthetic pathway.
3. Genetically modified *Escherichia coli* as claimed in claim 1 wherein the plasmid vector containing the DNA sequence is pSa240.
4. Genetically modified *Escherichia coli* as claimed in claim 1 wherein the sequence coding for poly-beta-hydroxybutyrate is a 4.826 kb fragment.
5. A multicopy plasmid vector pSa240 harboring the DNA sequence coding for poly-beta-hydroxybutyrate synthesis.
6. A method for producing poly-beta-hydroxybutyrate (PHB), said method comprising the steps of:
 - (i) isolating the DNA sequence coding for the poly-beta-hydroxybutyrate (PHB) biosynthetic pathway, from *Streptomyces aureofaciens* NRRL2209,
 - (ii) cloning the DNA sequence coding for PHB pathway into a plasmid vector pGEM-3Z to obtain a multicopy vector designated as pSa240,
 - (iii) transforming *Escherichia coli* JM109 with the plasmid vectyor pSa240 to obtain recombinant *Escherichia coli* JM109 bearing accession No.PTA1579 and harbouring the gene responsible for production of PHB, and

- (iv) culturing recombinant *Escherichia coli* JM109 in a conventional medium containing glycerol and recovering poly-beta-hydroxybutyrate.
7. A method as claimed in claim 6 wherein, the nucleic acid fragment coding for poly-beta-hydroxybutyrate synthesis pathway is a 4.826 Kb long fragment.
 8. A method as claimed in claim 6 wherein, the nucleic acid fragment coding for PHB pathway is isolated from *Streptomyces aurefaciens* NRRL2209.
 9. A method as claimed in claim 6 wherein, the DNA sequence coding for PHB pathway is cloned into the multicopy plasmid vector named pGEM-3Z.
 10. A method as claimed in claim 6 wherein, the plasmid vector harbouring the gene coding for PHB pathway is pSa240.
 11. A method as claimed in claim 6 wherein, *Escherichia coli* JM109 is transformed with the multicopy plasmid vector pSa240 at a temperature in the range of 14°-18°C in the presence of T4 DNA ligase enzyme.
 12. A method as claimed in claim 6 wherein, the recombinant *Escherichia coli* JM109 is deposited with ATCC and bears accession No.PTA1579.
 13. A method as claimed in claim 6 wherein, the transformed recombinant *Escherichia coli* JM109 when cultured in medium containing glycerol expresses the said biosynthetic pathway gene by producing poly-beta-hydroxybutyrate in recoverable quantities of at least about 60% of the dry cell mass of the *Escherichia coli* JM109 bacterial host.